

Short Term Infection Rates after TightRope CCL and Intra-Articular ACP – A Retrospective Cohort Study

Arthrex Research and Development

Introduction

Extracapsular cranial cruciate ligament (CCL) stabilization techniques such as TightRope (TR) CCL¹ and the CCL Repair Anchor² allow for effective surgical treatment using minimally invasive approaches. However, surgical site infections (SSIs) are still a major point of concern. A recent study reported lower infection rates (4.2%) associated with extracapsular stifle stabilization compared to the open tibial plateau leveling osteotomy (TPLO) technique (8.4%)³. There is growing evidence for the use of platelet-rich plasma (PRP) products, such as Autologous Conditioned Plasma (ACP)⁴, in reducing SSI rates⁵⁻⁸. Therefore, retrospective data analysis was performed on dogs undergoing CCL extracapsular stabilization surgeries at a single center using TightRope CCL and CCL Repair Anchor techniques, combined with intra-articular ACP, in an effort to optimize a protocol for reducing infection rates following CCL surgery in dogs.

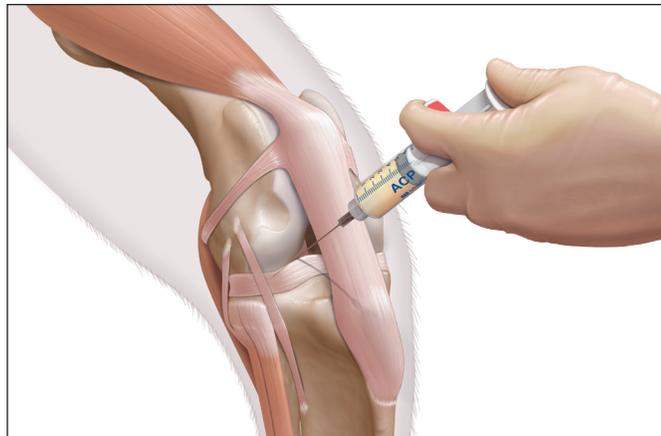


Figure 1

Methods and Materials

Consecutive cases undergoing arthroscopic joint assessment with mini-incision extracapsular stabilization surgery for CCL disease using either TR CCL (with FiberTape) or CCL Repair Anchor (with FiberWire) and receiving intra-operative ACP over a one-year period were included. For these cases, ACP was prepared from whole blood (starting volume of 12 mL) using the manufacturer's standard protocol⁴ and administered intra-articularly immediately after surgery (Figure 1). Cefazolin was administered intravenously prior to and after surgery, and cephalixin was provided for oral

administration for 2 weeks following surgery. All dogs were examined at 2 weeks postoperatively. At a minimum of 12 weeks after surgery, each owner was communicated with to determine if any redness, discharge, swelling, or licking associated with the surgical site, as well as moderate to severe lameness, was noted. If any of these were noted by the owners, the patient was examined by the attending veterinarian. If seroma was noted at any point, aspiration was performed for microbial culture and sensitivity testing. Infection was defined as positive culture results or clinical signs indicative of infection and requiring additional antibiotic therapy to resolve. The infection rate was determined using this data and was compared to the documented infection rate for cases operated during the previous 2 years using the same surgical techniques, implants, and standard protocol, only without ACP.

Results

A total of 168 dogs (157 TR CCL, 11 CCL Repair Anchor) were in the ACP cohort. The mean volume of ACP produced and injected was 2.25 mL (range of 1-4 mL). Seromas were observed in 19 patients at the 2-week follow-up. However, all bacterial cultures tested negative and no cases had additional clinical signs requiring additional antibiotic therapy to resolve. Consequently, no SSIs (0%) were diagnosed in the ACP cohort of dogs during the first 3 months postoperatively. Within the standard protocol cohort including 364 cases, there were 16 infections (*Pseudomonas aeruginosa*, *Serratia marcescens*, methicillin-resistant *Staphylococcus intermedius*, *Actinomyces viscosus*, or *Staphylococcus pseudointermedius*) diagnosed within the first 3 months after CCL surgery for an infection rate of 4.4%. The ACP cohort had a significantly lower ($p < 0.05$) probability for infection within the first 3 months postoperatively compared to a cohort of dogs not receiving ACP.

Discussion

As mentioned previously, PRP products such as ACP have been reported to possess antibacterial properties⁵⁻⁸. ACP concentrates the patient's own growth factors, improving signaling and recruitment of cells to the surgical site, which may optimize healing and decrease infection rate. In this clinical cohort study, there was a statistically significant reduction in infection rate by adding ACP to the operative protocol. Additional studies are needed to further investigate the effects of ACP on post-surgical infection rates in dogs.

Conclusion

Adding a single intra-articular injection of ACP to the operative protocol for minimally invasive extracapsular stifle stabilization reduced the infection rate down from 4.4% to 0%. This suggests that ACP may help optimize infection prevention strategies in veterinary orthopaedic surgery.

References

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